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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/913,696	08/16/2001	Sascha Marcus Spangenberg	668-63	2990

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EXAMINER	
WARE, CICELY Q	
ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 12/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/913,696	SPANGENBERG ET AL.	
	Examiner	Art Unit	
	Cicely Ware	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

2. The disclosure is objected to because of the following informalities:

a. Pg. 2, line 5, applicant uses the phrase "these algorithms has been found". Examiner suggests using "these algorithms have been found" for clarification purposes.

b. Pg. 3, lines 14-15, applicant uses the phrase "algorithms which has not hitherto". Examiner suggests using "algorithms which have not hitherto" for clarification purposes.

Appropriate correction is required.

Claim Objections

3. Claim 15 is objected to because of the following informalities:

a. Claim 15, line 2, applicant uses "Fast newton algorithm". Examiner suggests using "Fast Newton algorithm for clarification purposes.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-5, 8, 9, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art in view of Lim et al. (US Patent 6,240,099).

(1) With regard to claim 1, Applicant's Admitted Prior Art discloses in (Fig. 1) a direct sequence code division multiple access receiver comprising an adaptive filter controlled by an adaptive algorithm for filtering data which has been multiplied by a spreading code and filtered by a channel filter, the adaptive filter (1) having a length appropriate to model the inverse of the channel filter.

However Applicant's Admitted Prior Art does not disclose a multiuser detector operating on the output of the adaptive filter.

However Lim et al. discloses in (Fig. 1, Fig. 2B and Fig. 3) a multiuser detector operating on the output of the adaptive filter (col. 8, lines 38-39, col. 9, lines 17-20).

Therefore it would have been obvious to one of ordinary skill in the art to modify Applicant's Admitted Prior Art to incorporate a multiuser detector operating on the output of the adaptive filter so that a vector is recursively changed or updated in a systematic fashion in order to progressively better estimates of the symbols that were transmitted by each user (Lim et al., col. 6,lines 33-37).

(2) With regard to claim 2, claim 2 inherits all the limitations of claim 1. Applicant's Admitted Prior Art further discloses wherein the algorithm is trained using the signal of a desired user (Pg. 2, lines 29-36).

(3) With regard to claim 3, claim 3 inherits all the limitations of claim 1. Lim et al. further discloses in Fig. 1 wherein the algorithm is trained using a composite signal from more than one user.

(4) With regard to claim 4, claim 4 inherits all the limitations of claim 1. Lim et al. further discloses wherein the multiuser detector is of the minimum mean squared error type (col. 2, lines19-21, col. 7, lines 51-55).

(5) With regard to claim 5, claim 5 inherits all the limitations of claim 1. Lim et al. further discloses wherein the multiuser detector is of the zero forcing (decorrelating) type in order to invert the channel matrix in order to recover the transmitted signal vector (col. 1, lines 59-65, col. 2, lines 10-18).

(6) With regard to claim 8, claim 8 inherits all the limitations of claim 1. Lim et al. further discloses wherein the multiuser detector is of the cancellation type in order to subtract the estimated interference components (col. 2, lines 55-61).

(7) With regard to claim 9, claim 9 inherits all the limitations of claim 1. Lim et al. further discloses wherein the multiuser detector is of the near optimum decoding type in order to demodulate the bits transmitted by each user (col. 1, lines 24-31).

(9) With regard to claim 11, claim 11 inherits all the limitations of claim 1. Applicant's Admitted Prior Art further discloses wherein the algorithm comprises the recursive least squares algorithm (Pg. 3, lines 4-9).

6. Claims 6, 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art in view of Lim et al. (US Patent 6,240,099) as applied to claim 1 above, and further in view of Tanner et al. (IEEE, Volterra Based Receivers for DC-CDMA).

(1) With regard to claim 6, claim 6 inherits all the limitations of claim 1. Applicant's Admitted Prior Art in combination with Lim et al. discloses all the limitations of claim 1 above. However Applicant's Admitted Prior Art in combination with Lim et al. do not disclose wherein the multiuser detector is of the Volterra type.

However Tanner et al. discloses wherein the multiuser detector is of the Volterra type (abstract, Pg. 1167, col. 6-53).

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Applicant's Admitted Prior Art in combination with Lim et al. to incorporate wherein the multiuser detector is of the Volterra type because multiuser interference is nonlinear and for the best performance of the optimum receiver, which is a nonlinear filter (Tanner et al., Pg. 1169, col. 2, lines 11-16)

(2) With regard to claim 7, claim 7 inherits all the limitations of claim 1. Tanner et al. further discloses wherein the multiuser detector is of the Radial Basis Function type because it has a neural-network structure, which allows the calculation of optimum centres and weights (abstract, Pg. 1167, col. 6-53).

(3) With regard to claim 10, claim 10 inherits all the limitations of claim 1. Tanner et al. further discloses wherein the algorithm comprises the least squares algorithm to

estimate the filter coefficients without calculating the autocorrelation matrix explicitly (Pg. 1169, col. 1, lines 34-36).

7. Claims 12 -15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art in view of Lim et al. (US Patent 6,240,099) as applied to claim 1 above, and further in view of Carayannis et al. (IEEE Fast Sequential Algorithm for Least-Squares Filtering and Prediction).

(1) With regard to claim 12, claim 12 inherits all the limitations of claim 1. Applicant's Admitted Prior Art in combination with Lim et al. disclose all the limitations of claim 1 above. However Applicant's Admitted Prior Art in combination with Lim et al. do not disclose wherein the algorithm comprises the fast a-posteriori or sequential technique algorithm.

However Carayannis et al. disclose wherein the algorithm comprises the fast a-posteriori or sequential technique algorithm (abstract, Pg. 1394, col. 2, lines 21-31).

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Applicant's Admitted Prior Art in combination with Lim et al. to incorporate wherein the algorithm comprises the fast a-posteriori or sequential technique algorithm in order to take better advantage of the relationships between forward and backward linear prediction (Carayannis et al., abstract).

(2) With regard to claim 13, claim 13 inherits all the limitations of claim 1. Carayannis et al. further discloses wherein the algorithm comprises the stabilized fast a-posteriori error sequential technique algorithm (abstract, Pg. 1394, col. 2, lines 21-31).

(3) With regard to claim 14, claim 14 inherits all the limitations of claim 12. Lim et al. further discloses wherein said algorithm is used in combination with the Fast Newton algorithm in order to minimize the receiver structure to permit a further degree of freedom in modeling the signal (col. 6, lines 55-59).

(4) With regard to claim 15, claim 15 inherits all the limitations of claims 13 and 14.

Conclusion

8. The prior art made record and not relied upon is considered pertinent to applicant's disclosure:

a. Li et al. US Patent 6,621,850 discloses a block detection receiver.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 571-272-3047. The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Cicely Ware

cqw
December 13, 2004

AMANDA T. LE
PRIMARY EXAMINER